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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/762,490 | 01/23/2004 | Takemori Takayama | KOM-0153/INO/DIV 1 | 4923 |

23353 7590 03/11/2005

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| EXAMINER | |
|---|---|
| SAVAGE, JASON L | |
| **ART UNIT** | **PAPER NUMBER** |
| 1775 | |

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/762,490 | TAKAYAMA ET AL | |
| | Examiner | Art Unit | |
| | Jason L Savage | 1775 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *5 and 8-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5 and 8-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/193,625.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01232004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takayama'549 et al (US 5,948,549).

Takayama'549 teaches a copper based sintered contact material which is sinter bonded to an iron-base material (col. 1, ln. 7-11). Takayama'549 further teaches the contact may be a CuSn alloy which contains intermetallic materials including intermetallics of NiAl and TiSi wherein the intermetallic content is within the claimed wt% of 0.5 to 10 (col. 9, Table 3).

Regarding claim 8, Takayama'549 teaches that non-metallic particles may be contained in the contact including oxides (col. 5, Table 1, No. 20-26). While Takayama'549 teaches the non-metallic particle content in wt%, it is the position of the Examiner that a wt% of 1.5 or less would equate to a volume % of less than 4 % since the amount of material is directly correlated to the volume it would occupy.

Regarding claim 9, Takayama'549 teaches that Mo, Co, Fe may be dispersed in an amount within the range claimed by Applicant (col. 7, Table 2, No. 8-10 and 14).

Regarding claim 10, Takayama'549 teaches that graphite may be contained in an amount less than 1 wt% (col. 5, Table 1, No 14-15).

Regarding claim 12, Takayama'549 teaches that the contact contain roughly 10% Sn and 5% Pb (col. 7, Table 2, No 1-14).

3. Claims 5, 9 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Takayama'121 et al (US 6,613,121).

Takayama'121 teaches a copper based sintered contact material which comprises intermetallic material dispersed therein (col. 4, ln. 11-41). The intermetallic compounds may be formed from at least two elements such as an intermetallic of Ti alloyed with Al and/or Si or an intermetallic Ni alloyed with Al and/or Si (col. 9, ln. 9-35).

Regarding the limitation that the intermetallic compound is between 0.5 to 10 wt% of the contact, although Takayama'121 never specifically recites the intermetallic compound wt%, it does teach that the properties of the contact material can be optimized by controlling the dispersion of the intermetallic compounds (col. 9, ln. 43-49). Takayama'121 further teaches that the wt % of the intermetallic forming elements assists in achieving the desired dispersion of the intermetallics. Takayama'121 also teaches that depending upon the intended use of the contact material, the volume percent of the intermetallics can vary from 0.2 to 35 volume% (col. 9, ln. 43-64). Takayama'121 further teaches that about 0.1 wt% of the elements will result in about 0.2% by volume of precipitated intermetallic compounds. As such, the teaching of a volume % of between 0.2 to 35 volume% is interpreted as a teaching that the wt % may

vary between 0.1 to 17.5 wt%, a range which overlaps the range claimed by Applicant and anticipates the claimed range between 0.5 to 10 wt%.

Furthermore, although the wt% of the intermetallics that is formed is not shown, table 2 in column 17 shows some of the examples of Takayama'121 as having a combined wt% of intermetallic forming elements Al and Ti which are within the range claimed by Applicant (Nos. 18-20, 25, 28-29, 33-34, 38-39). Given the overlapping range cited above and the examples which have total amounts of intermetallic forming elements which fall within the range claimed, Takayama'121 meets the claim limitations.

Regarding claim 9, Takayama'121 teaches that the contact may preferably further contain metal elements such as Fe in an amount of 5 wt% or less (col. 8, ln. 46-63). Takayama'121 also teaches that metal or alloy particles comprised of W, Cr, Co may be added also (col. 8, ln. 30-33).

Regarding claim 12, Takayama'121 teaches that the contact may contain between 1-12 wt% Sn (col. 8, ln. 41-45) and may also contain Pb as well (col. 8, ln. 30-33).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'549 (US 5,948,549) as applied to claims 1-10 and 12 above in further view of Takayama'121 et al (US 6,613,121).

Regarding claim 13, Takayama'549 teaches what is set forth above but teaches a Sn content of up to 10 wt% as opposed to the claimed range of 12-16 wt%. Takayama'121 teaches that a copper contact containing up 12 wt% Sn may exhibit improved sinterability, particularly with regard to Cu-Al alloys (col. 5, ln. 60 – col. 6, ln. 2). Since Takayama'549 teaches the use of many Al containing copper alloys, it would have been obvious to one of ordinary skill upon reading the teaching of Takayama'121 that even higher Sn contents than what is exemplified in Takayama'549 may produce beneficial effects when sintering the copper contact.

Regarding the limitation that a Cu-Sn compound phase is dispersedly precipitated in the structure thereof, Takayama'549 specifically recites that a Cu-Sn compound alloy is added when forming the contact material and as such, one would reasonably expect precipitated Cu-Sn structures to be contained within the contact.

Regarding claims 14 and 19, Takayama'549 teaches that other elements such as Mn, Be and Ag may be added to the contact material (col. 16, ln. 17-60), although it is silent to the addition of lubricating particles such as those claimed. Takayama'121 teaches that solid lubricating particles including various fluorides can be used as well as S containing materials in order to positively affect the hardness and sinterability as well as improving the resistance to seizure of the sintered contact (col. 8, ln. 24-29). It would have been obvious to one of ordinary skill in the art to have recognized that solid

lubricating materials including those claimed by Applicant could be added to the contact of Takayama'549 in order to positively affect the properties of the contact material.

Regarding claim 15, Takayama'549 is silent to the sintered contact being a double-layered contact however, as is evidence by Takayama'121, sintered double-layered contacts are structure that are well known in the art (col. 1, ln. 53-67). Absent a teaching of the criticality of the contact being a double-layered contact, it would not provide a patentable distinction over the prior art since it would have been within the level of one of ordinary skill in the art to have formed the contact of Takayama'549 into any known contact structure, including a double-layered contact, with a reasonable expectation of success.

Regarding claim 16, Takayama'549 teaches that P is preferably contained in an amount of 0.1 to 1.0 wt% (col. 8, ln. 1-8). Takayama'549 further teaches that other elements such as Cr, Si, Al and Ti may be added as well (col. 10, ln. 1 – col. 10, ln. 25).

Regarding claim 17, the non-metallic particles disclosed by Takayama'549 would restrain shrinkage of the sintered layer just as much as the non-metallic particles claimed by Applicant.

Regarding claim 18, Takayama'549 teaches the addition of CuSn containing greater than 30 wt% Sn (col. 14, ln. 44-61). Takayama'549 also teaches the addition of Sn primary powder (col. 11, Table 4, No 18-25). It would have been obvious to have used both the High Sn containing copper and primary Sn powder since Takayama'549 teaches both are suitable for use.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'549 et al (US 5,948,549) as evidenced by Takayama'775 (US 6,015,775).

Takayama'549 teaches a copper based sintered contact material containing a variety of materials including graphite; however it is silent to the particle size of the graphite materials. Takayama'775 teaches a copper based sintered contact material (col. 4, ln. 15-23) which may contain solid lubricant particles such as graphite (col. 3, ln. 16-47). Takayama'775 further teaches that the particle size of the solid lubricant particles may be between 100 and 3000 μm (col. 3, ln. 17-29). Although Takayama'775 teaches that the solid lubricants are intended to protrude from the contact surface in order to provide a self-lubricating sintered sliding member whereas Takayama'549 is silent to the positioning of the particles, Takayama'775 is merely being provided as evidence that the use of solid lubricant particles having sizes within the range claimed is known in the art.

In response to the issue whether the reference is nonanalagous art, it has been held that the determination that a reference is from a nonanalogous art is twofold. First, one decides if the reference is within the field of the inventor's endeavor. If it is not, one proceeds to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved, In re Wood, 202 USPQ 171, 174. In the instant case, both Takayama'549 and Takayama'775 are generally drawn to copper based sintered contact materials containing solid lubricant particles. Absent a teaching of the criticality of the particles being within the range claimed by Applicant, it does not provide a patentable distinction over the prior art since the use of solid particles having

a size of less than 200 μm is known and would have been an obvious design choice to one of ordinary skill in the art.

7. Claims 8, 10, 13-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'121 et al (US 6,613,121).

Regarding claim 8, Takayama'121 teaches that other materials such as non-metallic particles of tungsten carbide and other ceramics may be added to the contact material (col. 4, ln. 21-39); however it is silent as to the amount of these particles that may be contained in the contact. Takayama'121 further teaches that prior art contacts have used non-metallic particle loadings of 3 to 8 wt% but teaches that such a high loading of these particles can have adverse effects on the sinterability, density and hardness (col. 3, ln. 1-15). Therefore, it would have been obvious to one of ordinary skill in the art to have included non-metallic particles in an amount greater than zero and less than 3 wt% since Takayama'121 specifically recites that such materials may preferably be added, however one would insure to limit how much is added so that other material properties such as sinterability, density and hardness are not negatively impacted.

Regarding claim 10, Takayama'121 teaches that both MnS and graphite may be used in the contact since they can be positively used as a hard dispersing agent of solid lubricant for preventing seizure (col. 8, ln. 24-29). Takayama'121 is silent to limiting MnS and/or graphite to 1 wt% or less; however, Takayama'121 does disclose that adding too much of certain materials can negatively impact the properties of the contact

(col. 3, ln. 1-15). Absent a teaching of the criticality of the claimed wt % of the two materials, it would not provide a patentable distinction over the prior art since it would have been within the level of one of ordinary skill in the art to determined what amounts of materials could be included in the contact without adversely affecting the material properties.

Regarding claim 13, the teaching of Takayama'121 that the contact may contain 12 wt% Sn anticipates the Sn content claimed since Applicant recites the lower limit of Sn may be 12 wt%. Regarding the limitation that a Cu-Sn compound phase is dispersedly precipitated in the structure thereof, since the copper contact contains the same Sn content as claimed and is sintered like the claimed copper contact, it is the position of the Examiner that the contact of Takayama'121 would also contain a Cu-Sn compound phase precipitated therein. The Patent and Trademark Office can require Applicant to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on Applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 U.S.P.Q. 431 (CCPA 1977).

However, in the event that the precipitated Cu-Sn phase is not inherently formed, Takayama'121 teaches that a Cu-Sn compound may be used to form the contact (col.

29, ln. 1-17). Therefore, it would have been obvious to one of ordinary skill in the art to have formed a precipitated Cu-Sn phase in the contact material since Takayama'121 teaches such a material can be used in the formation of the contact material.

Regarding claims 14 and 19, Takayama'121 does not exemplify an embodiment containing the claimed elements, however it teaches that elements such as Be, Mg, Ag may be added due to their ability to affect the hardness of copper alloys and positive effects on sintering (col. 8, ln. 20-23). Takayama'121 also teaches that solid lubricants including various fluorides can be used as well as S containing materials (col. 8, ln. 24-29). It would have been obvious to one of ordinary skill in the art to have used known solid lubricating materials, including those claimed by Applicant, as well as the elements recited by Takayama'121 in the contact material in order to improve the properties of the contact.

Regarding claim 15, Takayama'121 teaches the contact is sinter bonded onto an iron based backing such as a steel plate (col. 12, ln. 20-65). Takayama'121 does not exemplify an embodiment wherein the sintered contact is double-layered, however such a structure is well known and conventional in the art as is evidenced by Takayama'121 description of the prior art (col. 1, ln. 53-67). Absent a teaching of the criticality of the contact being a double-layered contact, it would not provide a patentable distinction over the prior art since it would have been within the level of one of ordinary skill in the art to have formed the contact of Takayama'121 into any known contact structure, including a double-layered contact, with a reasonable expectation of success.

Regarding claim 16, Takayama'121 teaches that the contact preferably contains 2 wt% or less of P which meets the claim limitation (col. 4, ln. 33-39). Takayama'121 further teaches that other elements such as Cr, Si, Al and Ti may be added as well (col. 8, ln. 3-23).

Regarding claim 17, the non-metallic particles disclosed by Takayama'121 would restrain shrinkage of the sintered layer just as much as the non-metallic particles claimed by Applicant.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'121 et al (US 6,613,121) as evidenced by Takayama'775 (US 6,015,775).

Takayama'121 teaches a copper based sintered contact material containing a variety of materials including graphite and/or MnS; however it is silent to the particle size of the graphite and/or MnS materials. Takayama'775 teaches a copper based sintered contact material (col. 4, ln. 15-23) which may contain solid lubricant particles such as graphite (col. 3, ln. 16-47). Takayama'775 further teaches that the particle size of the solid lubricant particles may be between 100 and 3000 μm (col. 3, ln. 17-29). Although Takayama'775 teaches that the solid lubricants are intended to protrude from the contact surface in order to provide a self-lubricating sintered sliding member whereas Takayama'121 is silent to the positioning of the particles, Takayama'775 is merely being provided as evidence that the use of solid lubricant particles having the sizes within the range claimed is known in the art.

Absent a teaching of the criticality of the particles being within the range claimed by Applicant, it does not provide a patentable distinction over the prior art since the use of solid particles having a size of less than 200 μm is known and would have been an obvious design choice to one of ordinary skill in the art.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'121 et al (US 6,613,121) in view of Takayama'549 (US 5,948,549).

Takayama'121 teaches what is set forth above but is silent to the contact containing Cu-Sn powder containing no less than 30 wt% Sn and/or Si primary powder. Takayama'549 teaches a copper based sintered contact material which is sinter bonded to an iron-base material (col. 1, ln. 7-11). Takayama'549 further teaches that the copper material may be a Cu-Sn alloy having a wide variety of Sn contents including greater than 30 wt% Sn (col. 14, ln. 44-61).

It would have been obvious to one of ordinary skill in the art to have used alternate copper alloys including the high Sn content alloys of Takayama'549 in the invention of Takayama'121 since they are taught to be suitable for use as sintered contact materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Savage
3-4-05

DEBORAH JONES
SUPERVISORY PATENT EXAMINER